Fig. 40 is a schematic diagram of one embodiment of a multi-channel sorter of the present invention showing two channels;

Fig. 41 is a work flow diagram of one embodiment of a multi-channel sorter of the present invention showing four channels;

Fig. 42 is block diagram of one embodiment of an analog cell analyzer (ACA) according to the invention;

Fig. 43 is a graph illustrating a stream of waveform pulses from a photodetector output detecting fluorescent pulses from cells streaming at an average rate of 10,000 cells/second;

Fig. 44 is an exploded view of Fig. 43 illustrating the stream from a photodetector output detecting three fluorescent pulses from three cells streaming at an average rate of 10,000 cells/second; a square wave of a 100MHz droplet clock has been superimposed on the illustration to show the synchronization between the three pulses and the square wave pulses of the droplet clock; 45-48

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Figs. 45 illustrates movement of a sperm cell relative to a laser beam spot having a narrow width;

Fig. 49 is an exemplary illustration of the digital information corresponding to a time-varying analog output from a photodetector detecting a single fluorescence pulse based on 122 samples at a 105MHz continuous sampling rate;

Fig. 50 is a schematic diagram illustrating the timing relationship between laser pulses, fluorescence emissions from a cell resulting from the laser pulses and the digital samples of the photodetector output in one embodiment of the invention;

Fig. 51 is a schematic diagram illustrating how the digital samples shown in Fig. 50 form a pulse waveform;

Fig. 52 is a schematic diagram of a pulse waveform from and X sperm cell synchronized with the pulse waveform of a Y sperm cell showing higher peak intensity in the pulse waveform for the X sperm cell;

Fig. 53 is a schematic diagram of a pulse waveform showing a threshold and integration window that can be used for pulse analysis;

Fig. 54 is a histogram of a sample containing X and Y sperm cells showing the high resolution attainable with slit scanning techniques;

Fig. 55 is histogram of a sample containing X and Y sperm cells showing the relatively poor resolution attained with standard illumination;

Figs. 56-59 show fluorescence histograms and scatter plots of peak vs. area for sperm nuclei and live sperm cells;

Figs. 60-61 illustrate a four-component model of a fluorescence intensity histogram for sperm cells – Fig. 60 shows raw data and Fig. 61 shows model curves generated by one embodiment of an iterative algorithm of the present invention based on the data shown in Fig. 60;